

### **REMARKS**

Upon entry of the present Amendment-D, the claims in the application are claims 1, 2, 4-6, 9 and 12, of which claims 1, 5 and 6 are independent. Claims 1, 4, 5 and 6 are amended herein. A Request for Continued Examination (RCE) under 37 CFR 1.114 was filed concurrently herewith with the require fee as set forth in 37 CFR 1.17(c).

The claims have been amended to more clearly define the subject matter which applicant regards as his invention. Specifically, the claims have been amended to limit the cavity forming member to be deposited by welding on the die and to limit the die to be used for metal casting. It is respectfully submitted that no new matter has been added to the application and the amendments are fully supported by the original disclosure.

The above-identified Office Action has been reviewed, the applied references carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present Amendment-D is submitted. It is contended that by the present amendment, all bases of rejection set forth in the final Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

Applicant respectfully submits that all of the above amendments are fully supported by the original application. Applicant also respectfully submits that the above amendments do not introduce any new matter into the application, since all of the subject matter thereof was expressly or inherently disclosed in the original application, including the drawings.

### **Claim Rejections – 35 USC 103**

**At item 3 of the Office Action, the Examiner rejected claims 1 and 3-4 under 35 USC 103(a) as being unpatentable over Horvath in view of Kumpula.** In the rejection, the Examiner states that Horvath discloses the die and method of manufacture thereof comprising use of a main

die body 16, 17 including a gate 14 and having a wall surface for defining a mold cavity and a cavity forming member 19, 20 or an insert die disposed or embedded at a location in a recess near the gate, the die main body and insert die are made of steel, and the insert part facing and forming part of the mold cavity.

The Examiner further states that Horvath fails to teach the use of better steel for the insert, and cites Kumpula for a teaching of using a better steel such as maraging steel as a mold steel for the purpose of effectively improving the thermal stability and mechanical properties of die parts. The Examiner states that it would have been obvious to modify Horvath to use better steel for the insert as taught by Kumpula in order to effectively reduce hot corrosion and stress impact due to casting of molten steel.

#### **Applicant's Response**

Upon review of the cited art and the Examiner's comments, Applicant respectfully traverses such rejection, and submits that each claim 1, 2, 4, 5, 6, 9 and 12 is patentably distinct over the cited art for the reasons expressed below.

The die of Horvath relates to the pressure molding of plastic parts. The inserts are soldered to the mounting block and placed within the die to limit wear from the injected plastics. Horvath specifically states that it is not possible to solder the inserts directly to the die walls since the heating of the die results in the tempering of the die walls, causing the die to fail sooner than expected (column 1, lines 40-50). More importantly, Horvath relates to a PLASTIC mold and thus cannot anticipate the difficulties caused by the high temperatures that metals require and the problems associated with these metals, such as durability of the die. There is no teaching to provide the die of Horvath in a metal casting environment.

Upon review of Kumpula, applicant repeats the analysis previously submitted in Amendment B. In particular, Kumpula discloses a precipitate-hardened maraging steel having high strength, good ductility, small thermal expansion coefficient, good thermal conductivity and significantly better thermal stability than other maraging steels. The preferred field of use for the inventive steel is as a mold material for pressure casting of light metal alloys. The properties of the steel of Kumpula are suited for use in a mold, but Kumpula does not teach or suggest forming a composite mold of more than one material.

Upon consideration of these disclosures, there is clearly no teaching for heating the die walls and fusing or welding inserts to the die. The precipitate of Kumpula may be a maraging steel but it is not disclosed as being welded to the die walls and only partially used in a die as claimed. In addition, there is no teaching in these references to weld or fuse the metal to the die. If anything, Horvath teaches AWAY from heating the die walls, while Kumpula teaches away from only using the maraging steel at certain areas of the die.

The applicant notes that the U.S. Court of Appeals for the Federal Circuit has established that a prima facie case of obviousness can be rebutted if the applicant ...” can show ‘that the art in any material respect taught away’ from the claimed invention” *In re Geisler*, 116F.3d 1465, 1469, 43 USPQ2d 1362,1365 (CAFC 1997). “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant” *Tec Air, inc. v. Denso Mfg. Mich. Inc.*, 192 F3d 1353, 1360, 52 USPQ2d 1294, 1298 (CAFC 1999), *In re Haruna*, 249 F 3d 1327; 58 USPQ 2d 1517 (CAFC 2001). Since Horvath teaches away from the applicant’s claimed device, instead of rendering applicant’s claims obvious, Horvath actually provides *evidence of non-obviousness* of applicant’s invention.

In this regard, applicant respectfully notes that the above noted distinctions are significant

and that the die according to the invention can be produced more efficiently, thus reducing the cost of parts formed from the die.

#### The Standard for Rejection under 35 USC 103

In order to determine obviousness as a legal matter, four factual inquiries must be made concerning: 1) the scope and content of the prior art; 2) the level of ordinary skill in the art; 3) the differences between the claimed invention and the prior art; and 4) secondary considerations of nonobviousness, which in case law is often said to include commercial success, long-felt but unresolved need, failure of others, copying, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459, 467 (US 1966); *Miles Labs v. Shandon*, 997 F.2d 870, 27 USPQ2d 1123, (Fed. Cir. 1993).

The U.S. Supreme Court has recently said that “[A] patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. . . . Inventions usually rely upon building blocks long since uncovered, and claimed discoveries almost necessarily will be combinations of what, in some sense, is already known. *KSR v. Teleflex*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (S.Ct.2007)

Applicant respectfully suggests that the Examiner must provide a convincing reason why he or she feels that it would be obvious to combine the elements of the cited references in the fashion claimed by applicant. “Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” (*In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) cited with approval in *KSR v. Teleflex*, *supra*.)

The U.S. Supreme Court has also stated that a factfinder should be aware of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning. See *Graham*, 383 U. S., at 36 (warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight”. *KSR v. Teleflex*, *supra*.

Applicant respectfully submits that the Examiner has not provided a convincing or persuasive reason why it would be appropriate to combine the references in the manner suggested by the Examiner, and respectfully points out that even if the references are hypothetically combined, for the sake of argument, the combination fails to produce applicant’s invention as claimed.

Applicant respectfully submits that the differences between the claimed invention and the cited references are substantial and significant, and therefore, applicant’s invention is non-obvious as compared to the respective teachings of the references.

**At item 4 of the Office Action, the Examiner rejected claims 5-12 under 35 103(a) as being unpatentable over Horvath in view of Kumpula and further in view of White et al.** In the rejection, the Examiner states that Horvath and Kumpula fail to teach the use of welding in depositing the maraging steel as an insert. However, White et al teaches spray welding tool parts and thus it would have been obvious to provide inserts on Horvath in view of Kumpula and White et al.

Applicant respectfully traverses such rejection, based upon the following reasons.

The rejection concedes that Horvath and Kumpula fail to teach the use of welding for fusing a maraging steel to a die. Thus the rejection relies on White et al to teach that maraging steels can be deposited on surfaces by spraying molten droplets onto a substrate. However, White et al teaches that the molten droplets must be sprayed upward and gravity allowed to

produce pendant droplets, Col 2, lines 55-60.

In addition, White et al teaches that after the object is formed, the substrate is removed, Col. 3, lines 20-25. Therefore, even if the die of Horvath was sprayed as disclosed in White et al, the sprayed metal would be removable from the die, clearly not what is needed to solve the problem discussed and solved by the present invention. In addition, the removal of the substrate in White et al makes this reference “non analogous art”.

According to MPEP 2141.01(a), the Examiner must determine what is analogous prior art for the purpose of analyzing the obviousness of the subject matter at issue. In order to rely on a reference as a basis for rejection of an applicants invention, the reference must either be in the field of applicants endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.

White et al clearly is non-analogous, since the subject matter relates to a releasable substrate and pendent shaped droplets, neither of which relates to a die with a welded portion to prevent the wear and premature failure of the die. Furthermore, White et al does not relate to welding of materials as conventionally understood. For example, welding is defined as the joining of two materials by applying heat to melt and fuse them together, with or without filler material. Again, White et al removes the substrate that the maraging steel is deposited on, thus there is no fusing of two materials as one would normally think when the term “welding” is used. Thus, since White et al does not teach providing a maraging steel as a fused layer as a die insert, the reference cannot be considered analogous art.

In addition, Komatsu et al cited by the Examiner in previous rejections, also teaches away from the present invention. The metal carbide layer of Komatsu et al may be sprayed onto the mold surface, column 2, lines 45-51. However, Komatsu et al further states that the metal

carbide layer is only bonded to the base metal with a mechanical bond making the mold unsuitable for use as a casting mold since this layer will PEEL OFF, column 2, lines 51-56. Applicant respectfully directs the Examiner's attention to MPEP 2141.02, Prior art must be considered in its entirety, including disclosures that teach away from the claims. Applicant has now noted two references that teach away from the claimed device in the present application. If the Examiner were to combine the cited prior art, hypothetically, the result would be a die with a sprayed on metallic layer that does not stick to the die and makes the die unusable in the casting process.

Although the applicant disagrees with the Examiner's rejection for the reasons stated above, in order to promote the prosecution of the application, the applicant has further amended claims 5 and 6 herein to recite that the cavity forming member is deposited by welding onto a face of the mold cavity and the die is for metal casting. These features are not suggested or disclosed in the cited prior art, as discussed above with respect to the rejections of the claims. As such, reconsideration and withdrawal of the rejections are respectfully requested

Applicant respectfully submits that the differences between the claimed invention and the cited references are substantial and significant, and therefore applicants' invention is non-obvious as compared to the Horvath, Kumpula and White et al references.

It is respectfully submitted that the noted differences between the claimed limitations and the cited art patentably distinguish over the references of record, whether considered individually or in any combination thereof.

### **Conclusion**

The applicant respectfully submits that all of the above amendments are fully supported by the original application. The applicant also respectfully submits that the above amendments do not

introduce any new matter into the application or raise new matters for consideration by the Examiner.

Based on all of the foregoing, the applicant respectfully submits that all of the rejections set forth in the Office Action are overcome, and that as presently amended, all of the pending claims are believed to be allowable over all of the references of record, whether considered singly or in combination. The applicant requests reconsideration and withdrawal of the rejection of record, and allowance of the pending claims.

If any issues remain unresolved, the applicant respectfully requests that the Examiner telephonically contact the applicant's undersigned representative to expeditiously resolve any such issues remaining in the prosecution of the application.

Favorable consideration is respectfully requested.

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